UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/894,225	06/27/2001	Aaftab A. Munshi	0269518 BEL-031	4829

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EXAMINER
SEALEY, LANCE W

ART UNIT	PAPER NUMBER
2671	

DATE MAILED: 04/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	09/894,225	MUNSHI, AAFTAB A.
	Examiner	Art Unit
	Lance W. Sealey	2671

— The MAILING DATE of this communication appears on the cover sheet with the correspondence address —

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>16 January 2004</u>.

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>6-8,15-17,23,27,34,38,44 and 48</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) <u>6-8, 15-17, 23, 27, 34, 38, 44 and 48</u> is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.

    If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

    a) ☐ The translation of the foreign language provisional application has been received.

15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .

4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

1.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth
>
> in section 102 of this title, if the differences between the subject matter sought to be patented and the
>
> prior art are such that the subject matter as a whole would have been obvious at the time the invention
>
> was made to a person having ordinary skill in the art to which said subject matter pertains.
>
> Patentability shall not be negatived by the manner in which the invention was made.

2.   Claims 6-8, 15-17, 23, 27, 34, 38, 44 and 48 are rejected under 35 U.S.C. 103(a) as being

unpatentable by Foley et al., Computer Graphics: Principles and Practice Second Edition in C

("Foley") in view of Persistence of Vision Ray-Tracer ("POV-Ray").

3.   Foley, in disclosing a simple recursive ray tracer, also discloses, with respect to claim 6,

object visibility rules specifying a relationship between light sources and certain rays (not

explicitly disclosed, but obvious to a person skilled in the art at the time the invention was made

because the code calculating the closest intersection of a ray with an object is a calculation of

whether an object is visible; see Fig.16.56, p.780), and looking up a rule associated with one of

the light sources when processing the certain rays for the light source (section in Fig.16.56

marked "Compute shade at point on object, tracing rays for shadows, reflection and refraction",

p.780. Any code doing a comparison during the implementation of ray tracing could be

construed as "looking up a rule".).

4.   However, Foley does not disclose ray tracing used for specific aspects of rendering; these

elements are disclosed by the POV-Ray ray tracing software. POV-Ray discloses a graphics

apparatus comprising a rendering system (2. Program Description) that renders an object in

response to a graphics input (4.3.1 Box Object) including object visibility rules (Foley), wherein

the rendering system includes a ray tracer (title)), the rendering system constraining the rendering

of the object in accordance with the object visibility rules (when using the POV-Ray code to

draw the box object in 4.3.1 Box Object, obvious to a person skilled in the art at the time the

invention was made to include the Foley code for object visibility rules because rendering is

quicker because the need is eliminated to directly calculate the intersection of objects—see

p.704, second paragraph),

5.   Therefore, it would have been obvious to one of ordinary skill in the art at the time this

invention was made to incorporate the POV-Ray software in the Foley ray tracing algorithm.

POV-Ray enables the other elements of rendering to be added to Foley's calculations of

intersections, shadows, reflection and refraction (POV-Ray, "2. Program Description").

6.   Concerning claims 7 and 16, Foley discloses certain rays including rays originating from

the light source and potentially intersecting the object (Fig. 16.51, p.777).

7.   Regarding claims 8 and 17, Foley discloses the ray tracer constructing a ray tree in

accordance with the object visibility rules (Hierarchies, pp.706-707).

8.   Claim 15 is similar to claim 6 except it discloses a plug-in. However, POV-Ray is a

plug-in to the operating system on which it runs (2.3 Which Version of POV-Ray should you

use?)
                           o

9.   With respect to claim 23, POV-Ray discloses a scene server that receives a graphics input

specifying a plurality of objects (obvious to a person skilled in the art at the time the invention

was made to disclose a scene server because 3.2 Basic Usage, second paragraph, discloses

receiving a graphics input specifying a plurality of objects, and obvious to separate one process

to run on its own server, like graphics input, because the Microsoft Computer Dictionary lists

transaction management as a benefit to separating an application for processing on its own

server), and Foley discloses extracting object visibility information from the graphics input (not

explicitly disclosed, but obvious to a person skilled in the art at the time the invention was made

because the code calculating the closest intersection of a ray with an object is a calculation of

whether an object is visible; see Fig.16.56, p.780), a ray tracer coupled to the scene server that

determines intersections of rays with certain of the plurality of objects included in the scene

(Fig.16.56, p.780), the ray tracer receiving the object visibility information and constraining the

ray intersection determination in accordance therewith (Fig.16.56, p.780), and constructing ray

trees associated with the certain objects and the intersections, the ray tracer constraining objects

to be included in the ray trees in accordance with the object visibility rules (Hierarchies, pp.706-

707).

10.   Concerning claims 27, 38 and 48, Foley discloses a shader coupled to the ray-tracer for

determining colors associated with the ray trees (incorporate the Hierarchies code on pp.706-707

with Fig.16.56 on p.780).

11.   Claim 34 is essentially the same as claim 23 except that claim 23 discloses a scene server

and claim 34 discloses a graphics apparatus. It is at least obvious that a scene server is a graphics

apparatus.

12.   Claim 44 is essentially the same as claim 23 except that claim 23 discloses a scene server

and claim 44 discloses a graphics method. It is at least obvious that claim 23 discloses a graphics

method.

13.   Accordingly, in view of the foregoing, claims 6-8, 15-17, 23, 27, 34, 38, 44 and 48 are

rejected as being unpatentable under 35 U.S.C. 103(a) by Foley in view of POV-Ray.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner

should be directed to Lance Sealey whose telephone number is (703) 305-0026. The examiner

can normally be reached Monday-Friday from 7:00 am to 3:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Mark Zimmerman, can be reached on (703) 305-9798. The fax phone number for the

organization where this application or proceeding is assigned is (703) 872-9314.

Any response to this action should be mailed to:

MS Non-Fee Amendment

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

or faxed to:

(703) 872-9306

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive,

Arlington, VA, Sixth Floor (Receptionist).

MARK ZIMMERMAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600